ATTACHMENT 6B
SUBPART BB COMPLIANCE PLAN

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6B 1.0 PURPOSE

The purpose of this plan is to provide guidance and to document the procedures and the assignment of responsibilities for compliance with 40 CFR Part BB Air Emission Standards for Equipment Leaks, for the CAMDS facility.

6B 2.0 SCOPE / APPLICABILITY (264.1050)

Subpart BB is concerned with detecting and repairing leaks from equipment in contact with organic compounds. Subpart CC, on the other hand, requires having engineering controls in place for containers and tanks in which HW containing VOCs are managed. The threshold regulatory organic concentrations are different for both of these regulations. Because of these differences and the complexity of these regulations, CAMDS decided to have a separate plan for Subpart BB to demonstrate compliance.

The requirements of this plan are applicable to all equipment items listed in Appendix A as defined by R315-8-18 Subpart BB (valves, pumps, flanges, piping connections, sampling connections, and pressure relief devices) at the CAMDS facility that contains or contacts hazardous waste containing organics at 10% by weight or greater.

Equipment containing organic concentrations of at least 10 percent by weight for a period of less than 300 hours per calendar year are exempt from these requirements (264.1050(f)) except for the identification of equipment as required in 40 CFR 264.1064(g)(6).

In general, Subpart BB requirements apply to hazardous wastes, either liquids, solids, and gases / vapors. In addition, at CAMDS any agent vapors or aerosols that may be present in the site ventilation and filter system are managed under the Subpart CC Compliance plan (in accordance with the applicable sections of Subpart AA, as referenced by the Subpart CC regulations).

At CAMDS, HW that meets or exceeds the 10% organics limits may be chemical agents and any associated volatile organic compounds as determined by R315-8-18. The chemical agents are normally 100 % organic. Upon demonstration and documentation, equipment listed in Appendix A may be exempt from Subpart BB. The facilities and equipment that could contact chemical agents are agent transfer lines associated with, but not limited to:

Rocket Shear Machine (RSM), located in the DFS facility
Multipurpose Demil Machine (MDM), located in the Multipurpose Demilitarization Facility (MDF)
Bulk Drain Station (BDS), located in the Multipurpose Demilitarization Facility (MDF)
Agent transfer lines between these facilities, the agent storage tanks, and the liquid incinerator

The equipment at CAMDS that is subject to this plan begins at the suction stations of the facilities listed above, and ends at either the primary combustion chamber of the LIC or at the charge car room of the MPF.

6B 3.0 INTRODUCTION

The purpose of the federal subpart BB standards is to control the release of fugitive VOC emissions from equipment items as defined above. A program of inspections, monitoring, leak detection, repair, record keeping and reporting as required by R315-8-18 accomplishes this.

The subpart BB standards apply to hazardous waste treatment, storage, and disposal facilities (TSDFs). Any equipment item as defined in section 6B2.0 above, which contains or is in contact with hazardous waste having an organic content of greater than 10 percent by weight, for greater than 300 hours per year, is subject to subpart BB.

The subpart BB standards include requirements for marking (tagging) all applicable equipment items, monitoring for VOCs, inspections, equipment repairing, record keeping, and reporting.

6B 4.0 GENERAL REQUIREMENTS

The effected equipment at the CAMDS facility is used for processing chemical agents.

The Subpart BB requirements make a distinction between "light liquid service" and "heavy liquid service". These distinctions are based on volatility of the materials being processed. The designation "light liquid service" applies to a liquid of which at least one component has a vapor pressure in excess of 0.3 kPa (2.25 mm Hg) and the sum of all components having a vapor pressure above 0.3 kPa comprises at least 20% by weight of the bulk liquid. Any liquid that is not in light liquid service is considered to be in "heavy liquid service." Equipment in light liquid service is subject to periodic leak monitoring, using EPA Method 21, at each point that leakage could occur. Less stringent requirements are allowed for equipment in heavy liquid service.

With the possible exception of Agent GA, the chemical agents at CAMDS may qualify as "heavy liquids." The definition of a heavy liquid is any liquid that is not a "light liquid" as defined above. The table below lists the chemical agents at CAMDS and the associated volatility information.

Equipment in heavy liquid service does not require Method 21 monitoring unless there is evidence of a potential leak. The types of evidence include but are not limited to olfactory, visual evidence of dripping, or audible.

Table 6B1.
Volatility of Chemical Agents[1]

Agent	Vapor Pressure [kPa] @ 20 deg. °C.
GA	0.0048
GB	0.283
VX	4.38E-5
H	0.0092
L	0.0294
MCB[2]	1.33

Agent GA is known to contain up to 50% by volume of monochlorobenzene (MCB). Since the vapor pressure of MCB exceeds 0.3 kPa at a temperature of 20 deg. C, and could be present at greater than 20% of the bulk liquid, it will be assumed that equipment in contact with agent GA is in light liquid service.

As shown above in Table 6B1, equipment in contact with all other agents does not meet the criteria for a light liquid, and therefore equipment in contact with all agents at CAMDS, with the exception of agent GA, is considered in heavy liquid service. The vapor pressure data reported in Table 6B1 for agent GB is based on pure agent. TOCDF has sampled and analyzed typical GB agent in munitions and bulk containers and has found significant amounts of lower volatility impurities present. Therefore, the vapor pressure of actual GB agent that could be processed at CAMDS will probably have a lower vapor pressure than the 0.283 kPa reported in the table.

6B 5.0 WASTE DETERMINATION METHODS

6B. 5.1 Waste determinations for organic content greater than 10 percent by weight will be conducted in accordance with CAMDS' waste analysis plan, Attachment 2, and follow methods as required by 264.1063. Hazardous wastes and Chemical agents that are known to contain greater than 10 percent by weight organics shall be managed in accordance with the Subpart BB requirements. Other waste liquids at CAMDS such as spent decon, PAS brine, liquid laboratory wastes, etc. that are determined or documented to have low ppm levels of organics, may be exempt from Subpart BB. The Waste Analysis Plan, Attachment 2, and R315-8-18 must document such determinations in the operating record as required. Waste determinations for volatile organics that are already required by the RCRA permit, Waste Analysis Plan, Attachment 2, must be documented in the operating record. This information may be used by CAMDS as the basis for knowledge of the waste.

6B. 5.2 Waste determination for leak detection monitoring. The Subpart BB regulations require that the performance criteria of EPA Method 21 be followed for detecting leaks of organic compounds from equipment. Method 21 is appropriate for applications where a variety of unknown organic vapors may be present. CAMDS already has strict monitoring requirements in place in the RCRA Part B permit, as Attachment 16, the Site Monitoring Plan.

6B. 5.3 Waste determination for pumps and valves in light liquid service. The Subpart BB regulations specify the use of ASTM D-2879-86. Since vapor pressure data are available for the chemical agents, and due to the safety and environmental risks of sampling agents, CAMDS will use the existing data for determining the light liquid status of agents as specified by R315-8-18.

6B 6.0 EQUIPMENT MARKING AND IDENTIFICATION

All equipment that is subject to subpart BB (valves, flanges, pumps, non-threaded pipe connectors, pressure relief devices, open ended valves, and sampling connections) that are in contact with hazardous waste liquids and sludges are required to be marked in a manner that distinguishes it from other equipment.

At CAMDS, most of the affected equipment is located in agent exclusion areas, not generally accessible without rigorous entry procedures. Equipment markings in these areas would only be visible to entrants, normally wearing PPE, and would not be visible to persons outside these areas.

As an alternative to marking each item of equipment, CAMDS will maintain an up-to-date set of Subpart BB drawings (Attachment 11) and a list of equipment (Appendix A) that identifies and shows the locations of all equipment subject to this plan.

The current list of equipment items, subject to Subpart BB, is maintained as Appendix A of this plan and the drawings identifying equipment locations is maintained as Attachment 11.

6B 7.0 REQUIREMENTS FOR EQUIPMENT IN LIGHT LIQUID SERVICE

As shown in Table 6B1 above, the only agent operations that could result in equipment processing in light liquid service are those with agent GA containing chlorobenzene.

At DCD, there are only 4-ton containers of agent GA in the stockpile. This small amount of agent will be treated by incineration in a process that is expected to be completed in a few days. Therefore if CAMDS can demonstrate that the total processing time of GA will be completed within the 300 hour per year limit, the exemption allowed by Subpart BB in 264.1050(f) applies. In any case, the requirements of 40 CFR 264.1064(g)(6) for listing the equipment still applies, irrespective of the exemption.

If the actual organic equipment contact hours exceed the 300-hour limit, all requirements for light material service must be complied with for GA processing.

At present, there are no plans for other workloads that will include processing HW in equipment in light liquid service. Therefore, the Subpart BB requirements for equipment in light liquid service are not included in this plan. In the event that CAMDS' workload changes to include such work, CAMDS will modify this plan as required.

6B 8.0 REQUIREMENTS FOR VALVES, PUMPS, PRESSURE RELIEF DEVICES, FLANGES AND CONNECTORS IN HEAVY LIQUID SERVICE (264.1058)

As stated above, the only equipment at CAMDS that may contain or contact hazardous wastes that are greater than 10 percent organic, by weight, are the chemical agents themselves, based upon waste analysis determinations required by R315-8-18 and R315-8-2.4.

The CAMDS facility has in place a state-of-the-art system of monitoring, engineering controls, and carbon filtration systems that are designed to control emissions of chemical agents (organic wastes, subject to Subpart BB) to the atmosphere. This system provides controls for each of the areas in the plant where the equipment, subject to Subpart BB, is located. The Site Monitoring Plan, Attachment 16 of the RCRA Permit, provides detailed information and the permit requirements for this system. This system is required to control agent emissions to the atmosphere at less than one STEL as shown in the table 6B.2.

Table 6B.2
Allowable Agent Concentrations from CAMDS Filter System

Agent	STEL mg/m^3	STEL (ppb)
GA	0.0001	0.1
GB	0.0001	0.1
H / HD / HT	0.003	3.0
L	0.003	3.0
VX	0.00001	0.01

Under Subpart BB, equipment that contains or contacts organic wastes (in light liquid, heavy liquid, and gas/vapor service) has an action level to commence repairs when leaks exceed 10,000 ppm, or detected by a method specified by R315-8-18 [40 CFR 264.1058].

The site monitoring and filtration system at CAMDS provides a level of protection from agent that exceeds the Subpart BB requirement.

All of the equipment subject to Subpart BB is located in specially designed areas under strict engineering controls to isolate plant personnel from potential agent exposure.

All of the agent operation areas are monitored continuously whether or not agent is actually present. These agent monitors are set to alarm at higher levels (up to 200 ppb, maximum). During some agent operations when agent is directly exposed, it would be normal for the high level alarms to go off. For continued high level alarms, CAMDS will respond by investigating and finding the leaks (visually) and making repairs as soon as practical. Any evidence of a leak will be considered a leak under Subpart BB, without any further monitoring required.

Any leaks found and repairs made will be documented in accordance with the record keeping requirements of section 6B.13 below.

All of the air from the agent operations areas is ventilated into the closed HVAC system and processed through carbon filters. The agent levels in the air discharged from the filter system are monitored and the records are maintained.

6B 9.0 REQUIREMENTS FOR SAMPLING CONNECTION SYSTEMS

Currently there are no sampling connection systems in place at CAMDS. If such equipment is added later, this document will be modified to include these requirements.

6B 10.0 REQUIREMENTS FOR OPEN ENDED VALVES

An open ended valve is any valve, except pressure relief valves, having one side of the valve seat in contact with the process fluid and one side open to the atmosphere, either directly or through an open pipe.

All open ended valves that are connected to piping in agent operation areas will be equipped with a cap, plug, blind flange, or another valve. If a second valve is used, the first valve must be closed before the second valve is closed so that no process fluid is behind the second or outer valve.

6B 11.0 REQUIREMENTS FOR COMPRESSORS

There are no compressors at CAMDS that are in contact with HW streams. Therefore these requirements are not applicable.

6B 12.0 LEAK REPAIR REQUIREMENTS

Any leaks from equipment at CAMDS shall be repaired as soon as practicable after discovery. In the interim between the discovery of a leak and the completion of the repair, all agent leaks will be controlled and captured in the site ventilation and filter system. As required by Subpart BB, the first attempt at repair will commence no later than 5 days from the discovery of the leak. The final leak repairs will be completed within 15 calendar days. All leak repair record keeping requirements of section 6B.13 must be met.

6B. 12.1 Standards for Delay of Repairs

Repairs to leaking equipment can be delayed provided that the following conditions are met:

a) Repairs must be technically infeasible without shutting down the hazardous waste management unit (HWMU). Repairs delayed for this reason must then be completed before the end of the next scheduled HWMU shutdown.
b) The equipment is valved out and isolated from the HWMU, and any hazardous waste (HW) is removed.
c) For valves, the emissions resulting from the repair are greater than emission resulting from delaying the repair (the purged material resulting from the repair must be collected and destroyed or captured in a control device).
d) For valves, repairs beyond the next HWMU shutdown are allowed if the valve must be replaced and valve supplies have been depleted (the valve assembly supplies must have been sufficiently stocked before they were depleted). This delay of repair past the next shutdown will not be allowed unless the next shutdown occurs sooner than 6 months after the first shutdown.
e) Repairs for pumps are allowed if the repair requires the use of a dual mechanical seal system that includes a barrier system, and the repair is completed as soon as possible but not later than 6 months from when the leak was detected.

6B 13.0 RECORD KEEPING REQUIREMENTS (264.1064)

6B 13.1 Subpart BB Equipment List

A comprehensive list of all equipment items at CAMDS that are subject to Subpart BB and equipment that are subject to record keeping requirements specified by R315-8-18 are maintained in Appendix A of this plan. The equipment list will be kept current as equipment items are added, removed, or modified as required by the permit modification requirements specified in the Permit.

6B. 13.2 Subpart BB Drawings

A complete set of P&ID drawings showing all equipment subject to Subpart BB, by HWMU or functional area, will maintained with current information in the operating record. Each equipment item will be given a unique ID number that includes a code or symbol indicating the type of equipment (ie. valve, pump, flange, etc.).

6B. 13.3 Tagging Procedure for Repair Work

A "VOC Emission Leak" tag shall be attached to any piece of equipment in which a leak is discovered.

Each repair tag will be marked with the following information: the date the evidence of a leak was found (date detected), and the equipment subpart BB ID number.

The repair tag may be removed from any equipment item after the equipment repairs have been successfully completed.

6B. 13.4 Designations of HWMUs at CAMDS

The table below outlines the assignment of equipment into HWMUs. These groupings were made according to functional boundaries.

The “P” prefix for pumps, has no connection with plant location or HWMU. Each pump is included in the HWMU of the area in which it is located.

Table 6B.3 HWMU Designations at CAMDS	
HWMU Designation	**Approximate Plant Location**
MDF (multipurpose demil facility)	Bldg. C-7047
BIF (bulk item facility)	Bldg. C-7046
BDS (bulk drain station)	Bldg. C-7046
Segregator Unpack Area	Bldg. C-7027
LIC (liquid incinerator)	Bldg. C-7045

6B. 13.5 Equipment Repair Record Keeping Requirements

All of the required record keeping information related to monitoring, leak detection, and repairs is maintained in the subpart BB operating record. The following information is a minimum of what will be entered into the operating record.

a) Instrument and operator ID numbers and equipment ID numbers. The instrument ID number is the serial number for the VOC analyzer. The operator ID number is the CAMDS badge number, and the subpart BB ID number is used to identify individual equipment items. For leaks discovered by methods other than a VOC analyzer, no instrument ID is required.

b) Date that the leak was found

c) Repair methods used to repair the leaking equipment

d) "Repair delayed" and the reason for the delay if the repair is not accomplished within 15 calendar days after detection of the leak, as required in 40 CFR 264.1059.

e) If the repair is delayed beyond 15 calendar days, if appicable, documentation supporting the delay of repair of a valve beyond the next HWMU shutdown in accordance with the requirements of 40 CFR 264.1059. This information shall be maintained in hard copy in the Subpart BB operating record.

f) For delayed repairs, a statement and signature of the owner or operator (or designee) who made the decision that a repair could not be made without a HWMU shutdown. This information shall be maintained in hard copy in the facility operating record.

g) For delayed repairs, the date of expected repair for equipment item if the leak is not repaired within 15 days, and the date of the final repair.

6B. 13.6 General Record Keeping Requirements

CAMDS shall comply with all record keeping requirements specified by R315-8-18 [40 CFR 264.1064].

Specifically, CAMDS must record the following information in the operating record for each piece of equipment to which Subpart BB applies:

Equipment identification number and hazardous waste management unit designation;

Approximate location within facility

Type of equipment

Percent-by-weight total organics in the hazardous waste stream at the equipment

Hazardous waste state at the equipment

Type of Compliance with the standard

The approximate locations of the equipment subject to subpart BB are shown on the Subpart BB drawings. The types of equipment are also shown on the drawings by symbols and also by a letter designation (or lack of it) in the BB identification number.

CAMDS must maintain a log that maintains all record keeping items listed in R315-8-18 [40 CFR 264.1064 (g)(h)(j)(k)(l) and (m) as required by R315-8-18.

The record keeping requirements of the closed vent system and control devices in use at CAMDS are included in the subpart CC plan, Attachment 6.

Currently, there are no equipment items that are designated for "no detectable emissions" at the CAMDS facility. If such items are added later, the record keeping requirements of 40 CFR 264.1064 will be completed and added to the facility operating record.

Record keeping information must be maintained for a minimum of three years.

6B. 13.7 Leak Detection and Repair Record Keeping

CAMDS, Risk Management Division, will maintain records documenting the dates leaks were discovered, the dates of the first attempt at repair, the types of repairs, and the dates that the repairs were completed. Record keeping of hours of contact and equipment ID numbers for operations using the exemption of less than 300 hours per year, under 40 CFR 264.50(f), as required by 40 CFR 264.1064(g)(6).

6B. 13.8 Exemption of Equipment

Records of waste determinations for equipment that is exempted from Subpart BB will be maintained in the facility operating record.

6B 14.0 RESPONSIBILITIES FOR SUBPART BB COMPLIANCE

6B. 14.1 CAMDS Risk Management Division, Environmental Group

Maintaining operating records for Subpart BB

Performing and documenting the inspections and monitoring

Submitting work orders to Maintenance when leaks are detected

Performing follow-up inspections, if necessary, after Maintenance has submitted notification that the repair has been completed.

Following the progress of active work orders to ensure compliance dates are met.

Preparing semi-annual reports to the regional administrator.

6B. 14.2 CAMDS Maintenance Department

Initiating the repairs within the required time of 5 days (unless this has already been done by a monitoring person, and documented on the work order)

Completing the equipment repairs within the required 15 calendar daytime period.

Documenting the type of repairs made on the work order.

Documenting the reasons for repair delays beyond the required time limit.

Notifying Risk Management after repairs are completed, provide hard copies of the completed work orders.

Ensuring that repair tags are completed and placed when performing maintenance work on Subpart BB equipment items, as required by section 6B.13.3. Removing repair tags from equipment after repairs have been completed.

6B. 14.3 CAMDS Engineering

Maintaining and updating the P&ID drawings showing each piece of equipment that is subject to subpart BB.

Furnishing Risk Management Division with the subpart BB drawings.

6B. 14.4 CAMDS Plant Operations

Reporting any visible leaks of HW from pump seals, and any evidence of leaking from other equipment items (flanges, pressure relief devices, valves, etc.) to the Environmental Group, Risk Management Division.

Operators working in the process areas need to ensure that all open-ended valves are plugged, capped, or fitted with another valve.

6B 15.0 MODIFICATIONS TO CAMDS EQUIPMENT (As Defined by Subpart BB)

To remain in compliance with the subpart BB requirements for equipment marking, monitoring, and record keeping, it is important that the Environmental Group is informed of any changes in the equipment. This includes removing old equipment without replacing, changing the equipment or piping configurations, or adding additional equipment.

The Change Management procedures that have been established at CAMDS is the primary mechanism for notifying the appropriate responsible individuals that a change will occur which may affect their areas of responsibility. For any project which will change HW piping or equipment (flanges, valves, pressure relief devices, etc.), the Environmental Group shall be informed in writing of the changes, including the dates that the physical changes were made.

All permit related documents and the Subpart BB P&ID drawings will be updated to reflect applicable equipment modifications.

6B 16.0 REPORTING REQUIREMENTS (264.1065)

CAMDS will report as specified by R315-8-18 [40 CFR 264.1065]. Reports shall be submitted to the regional administrator every 6 months, and shall contain the following information:

The EPA ID number of the CAMDS facility, the name and address of the facility.

For any equipment items for which leaks were discovered and which were not repaired within the 15 day limits provide the ID number, HWMU location, description of the piece of equipment, and the reason(s) for not completing the repairs within the required time.

Dates of any HWMU shutdowns.

6B 17.0 SUBPART BB REQUIREMENTS FOR SPECIAL PROJECTS

VX/Water Neutralization Project

In this project, waste VX agent is treated in containers in the Bulk Item Facility, in specially modified ton containers called Instrumented Ton Containers (ITCs). The agent is treated by injection of distilled water, which decomposes the agent by hydrolysis. The modified ton containers include extra sampling ports and pressure and temperate instruments, and include a pressure relief system and provisions for heating.

The equipment that contacts HW with greater than 10 percent organics includes the valves, connectors, and pressure relief devices connected to the ITC, and also on the agent transfer system. The agent transfer system consists of piping and valves for transfering agent from storage containers to the ITC. These equipment items are included in Appendices A and B. All of the leak detection and repair requirements for equipment in heavy liquid service, as specified in this plan, will be complied with.

Footnotes

1. Samuel, L.B., et al., 1983, Physical Properties of Standard Agents, Candidate Agents, and Related Compounds at Several Temperatures (U), Special Publication ARCSL-SP-83015, Chemical Systems Laboratory, Aberdeen Proving Ground, Md, June.

2. CRC Handbook of Chemistry and Physics, 64th Edition, Vapor Pressures ofOrganic Compounds, less than 1 atmosphere, pg. D-204.

3. Work Place Time Weighted Average, over 8 hours, March 15, 1988 Federal Register (53 FR 8504).

Appendix A

Subpart BB Equipment List